

CLAIMS

We claim:

1. A transmission assembly for producing a steplessly variable range
5 of speed ratios, comprising:
an input shaft;
an output shaft;
a variable speed ratio path driveably connected to the input shaft and
including a first output;
10 a fixed speed ratio path driveably connected to the input shaft and
including a second output;
a planetary gearset including a first input connected to the first output, a
second input connected to the second output, and an output driveably connected to the
output shaft; and
15 a coupler continually driveably connected to the second output, and
adapted to driveably connect the second output alternately to the first input and the
second input.
2. The assembly of claim 1, wherein:
20 an input of the variable speed ratio path is arranged coaxially with the
input shaft; and
an input of the fixed speed ratio path is arranged coaxially with the input
shaft.
3. The assembly of claim 1, wherein variable speed ratio path
25 comprises a variator for producing a continuously-variable, stepless speed ratio range,
the variator including:

truncated cones having mutually parallel axes, each cone having a conical surface having a large diameter section located adjacent a smaller diameter section of the other cone, and

5 a traction element displaceable along an outer surface of a cone, said element driveably engaged with the conical surface of each cone.

4. The assembly of claim 1, wherein fixed speed ratio path comprises:

10 a input pinion driveably connected to the input shaft; and
an input gear in meshing engagement with the input pinion, arranged coaxially with the first output, and adapted for a drive connection through the coupler to the second input.

15 5. The assembly of claim 1, wherein the planetary gearset comprises:

a sun gear driveably connect to the first output;
a ring gear driveably connect to the output shaft;
a carrier adapted for a drive connection through the coupler to the second output; and
20 a set of planet pinions supported rotatably on the carrier and in meshing engagement with the sun gear and the ring gear.

6. The assembly of claim 1, wherein the planetary gearset comprises:

25 a sun gear driveably connect to the first output;
a ring gear driveably connect to the output shaft;
a carrier adapted for a drive connection through the coupler to the second output; and

a first set of planet pinions supported rotatably on the carrier and in meshing engagement with the sun gear; and

a second set of planet pinions supported rotatably on the carrier and in meshing engagement with the ring gear.

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7. The assembly of claim 1, further comprising:

a final drive gearset including an output pinion driveably connected to the output, and an output gear in meshing engagement with the output pinion.

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8. A method for operating a power split transmission including a variable speed ratio path driveably connected to the input shaft and including a first output, a fixed speed ratio path driveably connected to the input shaft and including a second output, a planetary gearset including a first input continuously driveably connected to the first output, a second input connected to the second output, and a coupler, the method comprising the steps of:

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using the coupler to connect mutually the first output and the second input;

varying the speed ratio produced by the variable speed ratio path;

using the coupler to connect mutually the second output and the second

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input; and

varying the speed ratio produced by the variable speed ratio path.

9. The method of claim 8, wherein the planetary gearset includes a sun gear driveably connect to the first output, a ring gear, a carrier, and a set of planet pinions supported rotatably on the carrier and in meshing engagement with the sun gear and the ring gear, wherein:

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the step of using the coupler to connect mutually the first output and the second input further comprises using the coupler to connect mutually the first output and the carrier; and

the step of using the coupler to connect mutually the second output and the second output further comprises using the coupler to connect mutually the second input the carrier.

5 10. The method of claim 8, wherein the step of varying the speed ratio produced by the variable speed ratio path includes the step of moving the traction element along an outer surface of a cone such that the output shaft is driven in a stepless range of reverse speed ratios.

10 11. The method of claim 8, wherein the step of varying the speed ratio produced by the variable speed ratio path includes the step of moving the traction element along an axis of a cone such that the output shaft is driven in a stepless range of forward speed ratios.

15 12. The method of claim 8, wherein the step of varying the speed ratio produced by the variable speed ratio path includes the step of moving the traction element along an outer surface of a cone such that the output shaft does not rotate.

 13. The method of claim 8, wherein the variable speed ratio path
20 includes a variator for producing a continuously-variable, stepless speed ratio range, the variator including truncated cones having mutually parallel axes, each cone having a conical surface having a large diameter section located adjacent a smaller diameter section of the other cone, and a traction element driveably engaged with the conical surface of each cone, and wherein the step of varying the speed ratio produced by the
25 variable speed ratio path includes the step of moving the traction element along an outer surface of a cone.